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RESIDENTIAL, COMMERCIAL & INDUSTRIAL GHG REDUCTION POLICY OPPORTUNITIES UPDATED POLICY MATRIX

Guide to Notations

<u>Indicative Potential Emission Reductions* -</u>	<u>Indicative cost (\$/tCO₂e)</u>
High (H): Potentially capable of saving at least 1 Million Metric Tons CO ₂ e per year by 2020 (~1% of current AZ emissions)	High (H): \$50/tCO ₂ e or above
Medium (M): Potentially capable of saving from 0.1 to 1 Million Metric Tons CO ₂ per year by 2020	Medium (M): \$5-50/tCO ₂ e
Low (L): Unlikely to yield more than 0.1 Million Metric Tons CO ₂ e per year by 2020	Low (L): \$5/tCO ₂ e or lower
Uncertain (?): Too many unknowns to hazard a guess	Negative (Neg): option yields net benefits
<i>* Several measures overlap in terms of the emissions they would reduce. They may target the same emissions sources, but using different implementation pathways. The estimates shown here assume that measures would be implemented independently from, or instead, of other measures.</i>	

Indication of Priorities:

- **High:** High priority items are deemed deserving of considerable further analysis.
- **Medium:** Medium priority items will be carried forward, with the extent of further consideration and analysis to be determined later.
- **Low:** Low priority items will be moved to a separate list as options to be potentially considered at a later time.

		Priority: High, Med, Low	Implement. Level & Lead	Potential Emission Reductions	Indicative Cost (\$/tCO ₂ removed)	Co-benefits, Feasibility Considerations and Other Factors
1.	Energy Efficiency Programs, Funds, and Goals					
1.1	Utility Demand Side Management (DSM) Programs for electricity, natural gas, propane, fuel oil	High	Utility and/or contractor or ESCO	H	Neg/Low	Co-benefits include transmission/distribution system costs reduction. Significant potential overlap with many other options.
1.2	Energy Efficiency Funds (e.g. Public Benefit Funds) administered by State agency, utility, or 3rd party (e.g. Energy Trust)	High	State, regulator	H	Neg/Low	[As above]
1.3	Energy Efficiency Requirements (e.g. Utility Savings Goals or Energy Portfolio Standards)	High	State, utility, regulator	H	Neg/Low	[As above]
1.4	Market transformation and technology development programs	High	Federal, State, local	H	Neg/Low	
2.	Appliance Standards					
2.1	Expansion of State-level Appliance Efficiency Standards	High	State, regional	L/H	Neg/Low	Feasibility enhanced by ongoing effort to adopt California standards
2.2	Support for Federal-level Appliance Efficiency Standards	High	State, regional	L/H	Neg/Low	Potential overlap with previous option

		Priority: High, Med, Low	Implement. Level & Lead	Potential Emission Reductions	Indicative Cost (\$/tCO ₂ removed)	Co-benefits, Feasibility Considerations and Other Factors
3.	Buildings					
3.1	Improved Building Codes	High	Local	H	Neg/Low	Potential to also yield water savings, comfort/air quality improvements. Code changes advanced in some localities, beginning in others.
3.2	Promotion and Incentives for Improved Design and Construction (e.g. LEED, green buildings)	High	State, local	M/H	Neg/Low	Potential overlap with previous option [co-benefits as above]
3.3 (merge prev. 3.3-3.6)	Training and Education Programs and Certification for Building Planners, Builders/Contractors, Energy Managers and Operators, and Local Officials	Medium/ High	State, local	M	Neg/Low	[As above]
3.4 (prev. 3.7)	Increased use of blended cement (substituting fly ash or other pozzolans for clinker reduces CO ₂ emissions)	Low	State, local, industry	L/M	Neg/Low	May provide modest avoided waste disposal co-benefit, depending on standard practice
3.5 (prev. 3.8)	Reduction of emissions from diesel engines used in new construction developments		Local, builders	L	Low?	
4.	Education and Outreach					
4.1 (old 2.1.1)	Consumer education programs	Medium/ High	State, local	?	Neg/Low	Potential contribution difficult to estimate
4.2 (old 2.3.3)	Introduce in School Curriculum	Medium/ High	State, local	?	Neg/Low	[As above]
5.	Pricing and Purchasing					
5.1	Green Power Purchasing		Utilities	?	M/H	Interaction with RPS option.
5.2	Bulk Purchasing Programs for Energy Efficiency or other Equipment (Public or Private sector)		Local housing agencies, others?	L/M	Neg/Low	May interact with utility programs.
5.3	Net-metering policies		State, local, utilities	L/M	Neg/Low	
5.4	Time of Use Rates		State, utilities	L	Neg/Low	Significant utility system co-benefits

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6.	Technology Specific Policies					
6.1	Incentives for Renewable Energy Applications (Solar roofs, water heaters, etc.)		State, utilities	H	M/H	Programs could help to lower capital and installation costs
6.2	Clean Combined Heat and Power		State, utilities, industries	H	Neg-M	Cost dependent on price of natural gas; interconnection an issue; utility system co-benefits.
6.3	Promotion and Tax or Other Incentives (e.g. EnergyStar, credits for solar hot water)		State, utilities	H	Neg/Low	Interaction with appliance standards, utility programs.
6.4	Appliance Recycling/Pick-Up Programs		State, local, utilities	L	Neg/Low	Long-term impact uncertain
6.5	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)		Local??	M/H	Neg/Low	Results likely to vary substantially with design
6.6	Focus on specific end-uses/technologies: window AC units, lighting, water heating, plug loads, networked PC management, power supplies, motors, pumps, boilers, etc). Consumer products programs, may include incentives, retailer training, marketing and promotion, education, etc		State, local, utilities	(By option, range from L to H)	Neg/Low	Interaction with appliance standards, utility programs.

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7.	Non-Energy Emissions (HFCs, PFCs, SF6, CO2 process Emissions)					
7.1	Participation in Voluntary Industry-Government Partnerships		State, industries	?	Neg/Low	
7.2	Process Changes/ Optimization		State, industries	?	?	Impact, cost likely highly process-specific.
7.3	Leak Reduction /Capture, Recovery and Recycling of Process Gases		State, industries	M	?	
7.4	Use of Alternative Gases (other HFCs, hydrocarbon coolants, etc.)		Federal, state, industries	M/H	L/M	
7.5	Cement Industry: use of alternative fuels		State, industries	?	L/M	
8.	GHG Emissions-Specific Goals and Policies					
8.1	Support for switching to less carbon-intensive fuels (coal and oil to natural gas or biomass)		State, utilities	M/H	Neg/M	Cost dependent on relative fuel prices
8.2	Industry-Specific Emissions Cap and Trade Programs		State, industries	M/H	L/M	Highly dependent on specification of trading systems
8.3	Voluntary emissions targets		Industries	?	?	
8.4	Negotiated Emissions or Energy Savings Agreements		?	?	?	

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9.	Other					
9.1	Government Agency Requirements and Goals (including procurement)		Federal, state, local	?	Neg/Low	Potential overlap with other options
9.2	Focus on specific market segments: existing homes (weatherization), new construction, apartments, low income, etc.		State, local, utilities	M/H	Neg/Low	Potential overlap with other options
9.3	Reinvestment Fund		?	?	Neg/Low	Potential overlap with other options
9.4	Municipal Energy Management		Local	?	?	Potential overlap with other options
9.5	Focus on Small and Medium Enterprises (SMEs)		State, local, utilities	?	?	Potential overlap with other options
9.6	Industrial ecology/ by-product synergy		?	?	?	
10.	Solid Waste and Wastewater Management					
10.1	Solid Waste Source Reduction			M/H	?	
10.2	Solid Waste Recycling			H	?	Materials recovery, reduction of energy requirements for raw materials production
10.3	Separation and Composting of Organic Materials in Solid Wastes			?	?	Co-production of soil amendments
10.4	Capture/Use in buildings or industry of Methane from Landfills			?	?	Fossil fuel displacement a co-benefit
10.5	Capture/Use of Methane from Wastewater Treatment			?	?	Fossil fuel displacement a co-benefit